

AMENDMENTS TO THE SPECIFICATION

Please amend the specification as follows:

Please amend paragraph beginning on page 4, line 13 to read as follows:

Means for Solving the Problems Summary of the Invention

The present invention has been made with intent to meet a strong demand for overcoming the above-mentioned problems, and detects a leakage of hydrogen gas by utilizing a Raman scattering phenomenon that, when a laser beam is irradiated to a target, the wavelength of the laser beam is shifted by an amount corresponding to energy that is equivalent to the absorption energy of a target molecule, and by imaging a spatial intensity distribution of the Raman scattering light.

Please insert the following paragraph after the paragraph at page 9, lines 5-8:

Brief Description of Drawing

Fig. 1 is a block diagram showing the construction of a leakage gas imaging device 1 according to an embodiment of this application.

Fig. 2 is a graph showing an emission spectrum distribution of a hydrogen flame in an ultraviolet range.

Fig. 3a is a graph showing a spectral distribution of the Raman scattering light emitted from hydrogen gas (when both laser beams of 355 nm and 416 nm were irradiated).

Fig. 3b is a graph showing a spectral distribution of the Raman scattering light emitted from hydrogen gas (when only the laser beam of 355 nm was irradiated).

Fig. 3c is a graph showing a spectral distribution of the Raman scattering light emitted from hydrogen gas (when only the laser beam of 416 nm was irradiated).

Reference Numerals

10 hydrogen gas/flame image pickup unit

11 objective lens

12 optical band-pass filter (transmittable light selection means)

13 image intensifier (ultraviolet image capturing means)

14 electronic image pickup device

20 laser irradiation device

21 laser oscillator formed of Q-switch YAG laser emitting third

harmonic (wavelength: 355 nm)

22 laser oscillator (wavelength: 416 nm) oscillated with optical pumping

23 laser beam distributor

24 mirror

25 mirror for overlapping laser beams

26 laser-beam expander lens

30 image pickup unit for picking up image of monitoring target region

31 electronic image pickup device

32 objective lens

33 shorter-wavelength cut optical filter

40 time synchronization control unit

50 image processing unit

51 personal computer

52 display monitor

Please amend paragraph beginning on page 9, line 9 to read as follows:

~~Best Mode for Carrying out the Invention~~ Embodiments

The present invention is based on the finding that when a laser beam of about 355 nm, which is given as a third harmonic of a generally used Q-switch YAG laser, and a laser beam of about 416 nm, which is obtained by causing optical pumping with a part of the 355-nm laser beam to produce oscillation at a wavelength corresponding to a Raman shift of hydrogen, are irradiated to hydrogen gas at the same time, the wavelength of a resulting Raman scattering light is exactly the same as 309 nm, i.e., the peak wavelength of an emission spectrum of an OH-group contained in a flame. A leakage of the hydrogen gas and generation of the hydrogen flame are detected by imaging a spatial intensity distribution of the light at 309 nm.

Please delete paragraph beginning on page 16, line 14 as follows:

~~Brief Description of Drawing~~

~~Fig. 1 is a block diagram showing the construction of a leakage gas imaging device 1 according to an embodiment of this application.~~

~~Fig. 2 is a graph showing an emission spectrum distribution of a hydrogen flame in an ultraviolet range.~~

~~Fig. 3a is a graph showing a spectral distribution of the Raman scattering light emitted from hydrogen gas (when both laser beams of 355 nm and 416 nm were irradiated).~~

~~Fig. 3b is a graph showing a spectral distribution of the Raman scattering light emitted from hydrogen gas (when only the laser beam of 355 nm was irradiated).~~

~~Fig. 3c is a graph showing a spectral distribution of the Raman scattering light emitted from hydrogen gas (when only the laser beam of 416 nm was irradiated).~~

Reference Numerals

~~10 hydrogen gas/flame image pickup unit~~

~~11 objective lens~~

~~12 optical band-pass filter (transmittable light selection means)~~

~~13 image intensifier (ultraviolet image capturing means)~~

~~14 electronic image pickup device~~

~~20 laser irradiation device~~

~~21 laser oscillator formed of Q-switch YAG laser emitting third harmonic (wavelength: 355 nm)~~

~~22 laser oscillator (wavelength: 416 nm) oscillated with optical pumping~~

~~23 laser beam distributor~~

~~24 mirror~~

Application No.: 10/567,346
Art Unit: 2877

Response to Quayle Action
Attorney Docket No.: 062088

~~25 mirror for overlapping laser beams~~

~~26 laser beam expander lens~~

~~30 image pickup unit for picking up image of monitoring target region~~

~~31 electronic image pickup device~~

~~32 objective lens~~

~~33 shorter wavelength cut optical filter~~

~~40 time synchronization control unit~~

~~50 image processing unit~~

~~51 personal computer~~

~~52 display monitor~~